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Business Economics and Statistics

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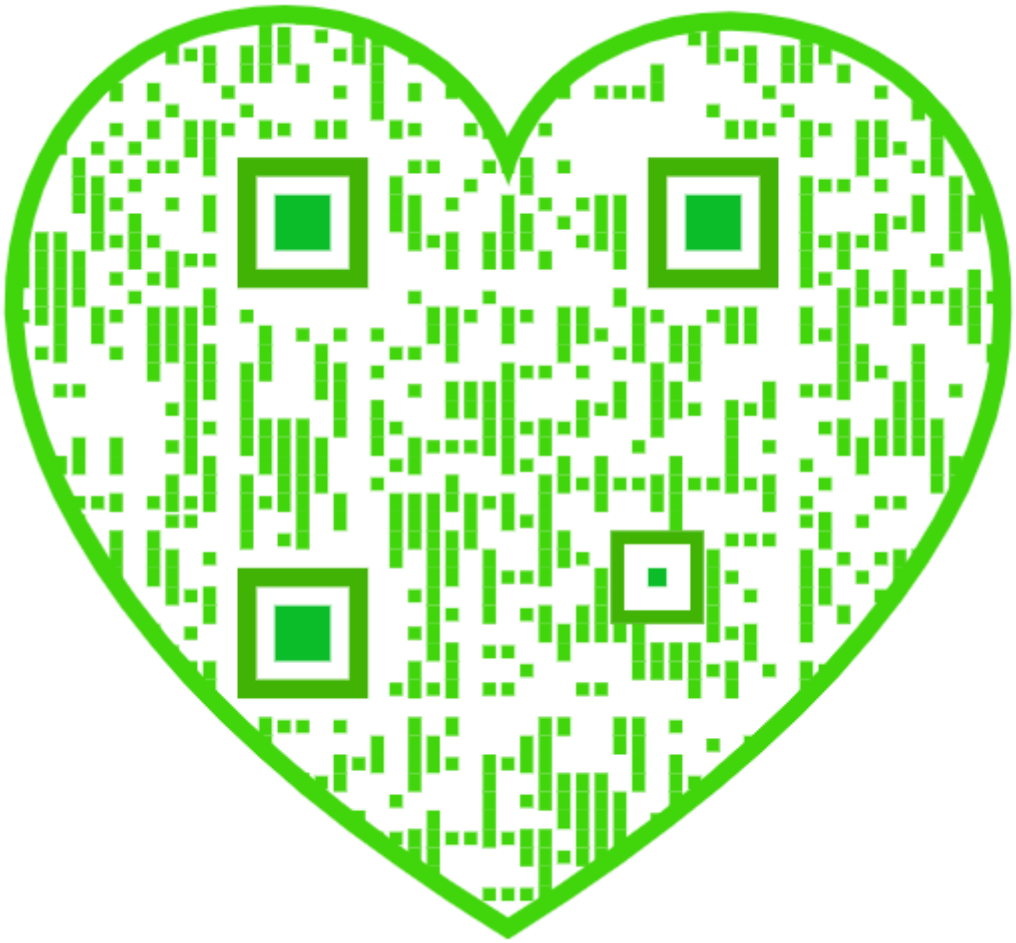

Lecture Text

Business Economics and Statistics

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but it has far-reaching practical applications. For unless we can answer it we have little power of forecasting costs and profits; and what is perhaps more important, we have no basis on which to judge what is normal and proper.

To answer the question we will do well to try to see the market from the "enterpriser's" point of view. By the enterpriser is meant the one who assumes responsibility and risk in the handling of wealth. To be sure, the term is often little more than an abstraction, for so complicated is the business world that few men assume this function solely. In some degree every active person is an enterpriser selling his services, the uses of his capital, or his goods. He is investing what he has, and is taking the inevitable responsibility and risk. But in addition he is also performing other functions. Many men who are enterprisers on a large scale are also managers, and as we have just seen should properly charge off a certain portion of their income to their own time before reckoning what their capital has made. Perhaps in the director of a corporation we may find the function of the enterpriser in its most elementary form, particularly when he turns investigation and management over to paid experts. And in any case we may conveniently personify responsible control of business in the figure-head of the enterpriser, however much the function may in fact be divided.

Let us assume the case of the enterpriser of a large industrial corporation. He is using his own and associates' property, borrowing funds, hiring labor, purchasing equipment and supplies, and placing goods on the market. Suppose for the sake of argument that business in general is progressing fairly smoothly. Such change as occurs comes gradually, and is anticipated with some degree of accuracy. What now will determine the rent, interest, profits and wages that the enterpriser pays?

The usual answer to this question is the law of supply and demand. This is quite correct, but it is too broad a generalization to be of much help. We must go further, and inquire into the conditions of supply and demand in each particular case.

2. HOW THE INTEREST RATE IS DETERMINED

Let us study, first, the interest rate. When the enterpriser floats bonds, or borrows at the bank for temporary purposes, what rate will he pay? The common answer is that the rate depends upon the amount of money in the country. But this answer is, in the main, wrong. It is one of the fallacies that practical men drop into by judging from a narrow view of the market. It is, of course, true that if a considerable volume of money comes rather suddenly into the banks the interest rate may temporarily fall. Such a case may occur when gold comes in from new discoveries, or when large volumes come in from abroad as in 1915 and 1916. The same effect may be produced when for any reason the banks feel safe in expanding their loans as compared with their reserves. Or, in times of dull business, it may occur simply because the money which usually actively circulates through the community is beginning to accumulate at the banks. But a low interest rate thus caused is transient. As soon as the money available for loans begins to be drawn upon, and the money and credit go into active circulation, prices begin to rise. Then larger loans are needed to carry business, and the rate rises. The quantity of money affects prices somewhat permanently, but it affects the interest rate only temporarily in the process of adjusting the price level. In 1920 the money in circulation per capita in the United States had increased sixty-six per cent over what it was in 1910, but the interest rates had risen rather than fallen. The change is shown in more detail in the following table, which shows also the temporary lowering of the interest rate that came with the gold importations from Europe in 1915 and 1916.

TABLE I. THE INTEREST RATE IN THE UNITED STATES

YEAR	CIRCULATION PER CAPITA	INTEREST RATES (prime 60-90 day paper)
1910	$34.33	5.0%
1911	34.20	4.0%
1912	34.34	4.8%
1913	34.56	5.7%
1914	34.35	4.9%
1915	35.44	3.4%
1916	39.29	3.5%
1917	45.74	4.8%
1918	50.81	5.9%
1919	54.33	5.4%
1920	57.09	7.4%

There are, then, temporary fluctuations in the interest rate that are influenced by the quantity of money. If general prices are abnormally high or low, considering the available quantity of money, interest for a brief time will be correspondingly high or low. And high interest helps to bring prices down to normal, while low interest helps to spur them up, because interest influences the amount of bank credit which is used to supplement money. But aside from this matter of adjusting the price level, the real cause of the usual level of the interest rate remains to be discovered.

Fortunately, we have not far to look. Any banker will say that in the long run an abundance of capital comes primarily from saving. This is no doubt the explanation of the interest rate as far as the supply of capital is concerned. Of course the amount that may be saved at a given time is limited. The greater part of most incomes is spent for necessities, and is therefore just as much invested as if it were put into bonds, since it serves to maintain the citizenship of a nation. But after all that may liberally be called necessities is paid for, there remains in modern times a large

surplus. This surplus may be insignificant among the poor, but it aggregates a large amount among the middle classes and the well-to-do. The very rich may readily save and invest the larger part of their incomes. If this surplus is lavished on more or less unnecessary pleasures and dissipations, business progress must come to a halt. If it is saved it goes to swell the volume of money and credit available for loans and—other things being equal—helps to keep down the interest rate. That is, the ease with which new capital may be obtained depends upon the general thrift. If everyone should religiously refrain from spending anything excepting for the necessities and charities that contribute to his own and the public efficiency, the maximum of thrift would be attained.

Thrift, then, makes capital available. But this is, after all, merely one side of the question, and the negative one at that. Before anything can be saved it must be produced. Hence the intelligence, energy and resources of a people are the real source of saving. So it happens that, wasteful as the American people are, they nevertheless save more than the thrifty populations abroad. We may at least congratulate ourselves upon our capacity for production, even while acknowledging our short-comings in respect to thrift.

From still another angle the capacity for production is highly important in its effect upon the interest rate. This is from the standpoint of the demand for capital. To see this, let us return to the enterpriser whose point of view we were endeavoring to hold. He and others like him are evidently one side of the loan market which determines the interest rate. The enterpriser voices the demand for capital, while the interest rate is set at the point of equilibrium between the demand and the supply. Now, what will determine how high a rate the enterpriser will be willing to pay? If he is borrowing for a temporary need, he may perhaps pay an emergency rate which will impair his usual profits, but if this happens he will be likely to reduce his operations. Thus he will later be less of a factor in the market.

If others do the same as he, the high rate will come down for lack of borrowers.

Or, we may suppose that the enterpriser is planning to sell long-time bonds in order to obtain funds for the permanent expansion of his plant. Before offering the bonds he will sit down and figure out how much of a return on his increased investment he may expect. He will estimate whether the raw materials and labor which are required for the construction of the new buildings and machinery will result eventually in an adequate return. Will the venture pay expenses, depreciation, the interest on the bonds, and a reward for the time and effort of planning? In making his calculations he is directly or indirectly contrasting his own situation with that of other business men who are bidding against him for the use of the public's savings. If he thinks he can make enough to justify paying the rate that others are paying, he will borrow; that is, he will place his bonds on the market. The rate that he can make the money earn is therefore the determining factor of demand in setting the general level of the interest rate.

To summarize: The interest rate fluctuates temporarily with changes in the quantity of money and credit in circulation. But in a fundamental sense, the supply of capital is determined by effective thrift, while the demand is principally determined by what the enterpriser can make new capital earn in the expansion of his business. The interest rate at any given time is that which will approximately balance the supply and demand sides of the market.

3. THE TOTAL EARNINGS OF CAPITAL

Having stated the law of interest, we may now briefly turn to the two other forms of income going to capital; namely, rent and profits. It will easily be seen that both are of essentially the same nature as interest. In renting property a man expects to get enough to cover its upkeep and the trouble of looking after it, and in addition the usual rate of interest on its capital value. Hence rent expresses approximately an interest yield.

But just here the practical man often trips upon a little turn of logic that is very important in connection with the evaluation of property. Property has no intrinsic value apart from, its earnings, on which a rental may be figured. This is particularly true of land, though it is not so true of improvements that may readily be added or removed to other uses. The value of the property as a whole arises from the income that it will produce. If we are sure that a given piece of property will continue to net, say, a thousand dollars a year, then as an investor we might be willing to pay $20,000 for it. In so doing we would be making five per cent on our money. If there was considerable risk connected with the property that could not be readily written off as an insurance expense, then we would probably offer less in order to be assured of a higher rate of return on the investment. But if the risk was negligible and the usual interest rate low, we might pay $25,000, which would give a yield of four per cent. On the other hand, if the property is likely to deteriorate, as a worked-out mine, a corresponding deduction from its capital value will naturally be made. Mathematically stated, the general rule is that the capitalized value of property is the present worth of the future net returns that are expected to arise from it.

Practically the same rule applies to profits. In so far as the net earnings of a corporation can be anticipated, the value of the shares reflects the present worth of these earnings. The owner of the shares usually carries, however, more of the responsibility and risk of the business than the holder of the bond carries. Hence it requires on the average a somewhat higher rate of returns to attract him. But in well established corporations there often comes to be little real distinction between the ownership of shares and bonds. Both represent savings applied to the purchase of incomes.

The problem that the enterpriser must meet, of whether he shall further expand his business, suggests another of the fundamental laws of economics. This is the law of diminishing returns. The term when first used was applied principally to agriculture. It was observed that when a farmer increased the amount of capital and labor applied to a given piece

of land, that the returns he got for his outlay gradually fell off. When he first doubled his outlay, it was possible that he might on the average double his crop. He might even do better, and get increasing returns. But if he doubled his outlay a second time, it was very unlikely that he would again double his crop. If he increased his outlay ten times, he certainly would not get a ten-fold crop. That is, his returns compared to his outlay would decrease. Later, it was seen that the same law applied in a general way to the profits arising from practically any business, or any industry as a whole. The industry that is expanded beyond the point warranted by the average growth of the country and the condition of the market sooner or later finds its profits dwindling. On the other hand, if it holds back too timidly, it may make a good rate of profits, but yet lose the volume it might have had. Thus the profits that lie just at the "margin" of expansion—that is, which are next within reach—are the economic signposts pointing to the proper size for an industry.

The law of diminishing returns operates in practically the same way for the individual business man or business unit as it does for a whole industry. An enterpriser must find the proper limit suitable to his capacity. He will lose either by undertaking too little or too much. Conditions will vary in different lines. The manufacturer of fine shoes, who must supervise much hand work, cannot profitably handle so large a plant as can the manufacturer of work-shoes, who uses machinery principally. By responding to the law of diminishing returns, or of increasing returns as they may appear at first, businesses and industries grow into a certain relationship to each other, such that the public demand for goods is met in due proportions.

A very practical side of the law of diminishing returns is seen in the application of statistics. By keeping a statistical check on the growth of various industries, the banks are able to estimate whether credit is being locally over-extended or not. The industries that have the most recklessly

expanded under the spur of good times are just the ones that will be hit the hardest when a crisis comes. An adequate statistical knowledge will greatly lessen this danger, and will tend to keep businesses moving together.

The enterpriser, then, has various opportunities of investment into which he may turn the capital under his control. These opportunities fall under the two headings already discussed. First, he may expand his business temporarily or permanently. In so doing he anticipates a certain rate of profits on which he bases the interest rate which he will be willing to pay. Naturally, capital devoted to expansion tends to be attracted into the most profitable available channels. By the law of diminishing returns it therefore tends to bring down the rate that may be earned on further expansion. On the other hand, new inventions and new avenues of foreign trade are continually opening up increasing returns. Secondly, if expansion is relatively uncompromising, the enterpriser may direct capital into the buying of businesses already established and matured. In so doing he helps to drive up the price of these properties until the rate of yield on the investment becomes unattractive. "Passive investment" of this sort applies to the stocks and bonds of corporations, to speculation in commodities, and to real estate holdings great and small. Because capital can thus swing from the less promising to the more promising field, the interest, rent and profits rates tend to equalize, though in fact when business is active, inequalities may be created more rapidly than they can be wiped out. Of course differences in risk are assumed to be allowed for. The average returns on all classes of capital is often spoken of as a prevailing interest rate. Like the sea level from which altitudes are measured, it is a useful figure of speech, but hard to visualize.

Before leaving the subject of the interest rate, one further question remains to be considered. Suppose that over a considerable period of time the interest rate prevailing in one country is low, while in another remote country it is high. What does this contrast indicate? It is commonly said that it measures the thrift of the people. Low interest seems to indicate

an abundant supply of capital, and high interest a scarcity. So the people where the low interest rate prevails are commended for their thrift, and the others are blamed for their sloth. Such a judgment might be merited, but it by no means necessarily is correct. The mere fact that interest is generally high or low gives us no basis for such a judgment. In a new country where the utmost possible economy rules, interest may be high simply because of the abundant profits that arise from expansion. The same may be said of an old country which is being rejuvenated by a series of profitable inventions. On the other hand, a slothful or luxurious people may suffer from a high interest rate because they refuse to save. Again, low interest may be due to lack of opportunity, or the timidity of enterprisers, and may be accompanied with much luxury spending of the surplus incomes. Hence the interest rate taken alone is no index of the business character of a people.

We have seen that the two general factors in production are capital and labor. Capital consists primarily of the land, and the buildings and equipment that have been accumulated upon it. It is expressed as a money value. This value depends upon the incomes that are anticipated from a specific property, and the prevailing interest rate. The term labor covers all valuable effort, from the planning of the manager and the research of the inventor, to the crudest forms of manual work. The value of labor is expressed in the market as a wage, using the term in the broad sense already indicated. The question of what determines wages in an open market will now be considered.

4. WAGES AND THE WAGE LEVEL

Like capital investment, labor finds many avenues open to it. The worker, seeking to invest his energies, naturally tends toward the more profitable market, insofar as his aptitudes, likings, and opportunities allow. But the movement of labor from one occupation to another is strictly limited by habit, and by the difficulties of mastering a new technique.

So the process of equalizing wages in proportion to service is slow. In the professions it is gradually brought about by the influx of new recruits into the better paying fields. In the semi-skilled occupations, however, there is considerable shifting of labor from one line to another. In occupations of about the same grade, wages are thus approximately equalized.

If all men had equal ability and opportunity, wages in all occupations would tend to an equality. Only minor features of agreeableness or disagreeableness would give a basis for any permanent difference. But in fact wages are naturally very unequal because of inherent differences in ability. Differences in opportunity also play a large part, but even if these were equalized, important wage contrasts would still be based on natural differences. Genius is extremely rare, talent is scarce, moderate capacity is abundant, while fortunately real incapacity is scarce. It is true that genius does not always bring its proper reward, because the market sometimes fails to appreciate it. But the talent of the professional classes commands a high return because it is both serviceable and scarce.

Just as there is a prevailing interest rate, so there may be said to be a prevailing wage rate. This prevailing rate is most readily measured on the basis of common labor. But what is true of common labor, will under modern conditions generally be true of the higher grades of labor as well. Men rise from the lower to the higher ranks, and so moderate the extremes. If salaries are high, common wages will also be proportionately high. Thus the high managerial salaries in the United States are paralleled by the high rate for common labor. The level of common wages may therefore be taken as a base line by which to compare general wages in different countries, or at different times.

The wage level is determined in somewhat the same way as the interest level. Enterprisers in operating and expanding their properties bid for labor. When business is active, they are likely to employ all who are employable, and to seek to obtain more by immigration. It is to their interest to

keep practically all the labor force employed in order to attain maximum production and profits. But at times they may over-do their competitive bidding for labor, and send wages above their normal level. When this occurs, business becomes less profitable, and therefore slackens. Hence the volume of business will tend to conform closely to the limits of the labor force, though fluctuating above and below these limits.

The size of the wage will evidently be limited by the productivity of labor. The economist would say the "marginal productivity," since it is the results obtained by adding to the labor force that serve as the practical measure of productivity. As long as enterprisers are able to make more than normal profits by adding to their labor force, they will be actively in the labor market. When an increase in the number of workers employed brings in no returns above the added wage cost, further employment will stop. At this point, more or less accurately estimated, equilibrium is reached.

The demand for labor, then, expresses itself principally through the bidding of the enterpriser. His capacity for bidding is the productivity of his business. A country with rich natural resources, able enterprisers, and industrious and capable workers, will bid strongly for labor. The supply of labor is the aggregate of services sold by the working population. This, in general, is proportionate to numbers. Wages are set by the usual equilibrium between demand and supply. This does not contradict the previous statement that the marginal productivity of the laborer sets the wage, since the marginal productivity responds to the supply in accordance with the law of diminishing returns, and is the basis of effective demand.

Since supply and demand rule in the labor market, it is often thought that a considerable lessening of the labor supply will raise wages. This is not necessarily the case. It is true that a sudden shortage of labor may temporarily send up wages, but if the shortage is permanent, some businesses will close and the labor demand will diminish. It is evident that an extremely sparse population in a fertile country is not favorable to high wages, since division of labor then becomes difficult. The immigration

into America during the past century probably did not lower wages except locally and temporarily. On the contrary, it probably raised wages by making possible the diversified industries which now create the demand for labor. But after the point is past where the numbers of the population are suitably proportioned to the available resources, then further additions to the labor supply will lower wages. The former conditions give increasing returns; the latter decreasing returns.

In view of the fact that population is continually increasing, the extreme importance of progress in business becomes evident. When adequate progress is maintained, enterprisers will have increasing incomes at their command with which to bid for labor. Using better machines and processes, labor will be more productive. Though some loss may be occasioned by the necessity of learning new methods of work, yet wages will be constantly rising. But if surplus wealth is squandered in luxurious living, new capital will be lacking, and progress may fail to keep abreast of population. Wages will then fall.

More than a century ago a famous economist predicted that population would always increase so fast that wages would be driven down to the point of bare subsistence. Thus far his prediction has not proved true, nore does it seem likely to come true in the immediate future. It is true that population has increased with great rapidity during the past century, but production has increased still more rapidly. The estimates given in the following table show this fact for the United States during the past few decades.

TABLE II. THE PRODUCTION OF WEALTH IN THE UNITED STATES

DECADE	POPULATION [millions]	PRODUCTION AT 1913 PRICES [billions of dollars]	PER CAPITA PRODUCTION
1870–1880	44	8	$180
1880–1890	56	12	210
1890–1900	69	17	240
1900–1910	84	25	295
1910–1920	100	35	350

From this table it appears that per capita production or income, as measured in constant prices, has almost doubled in forty years, and is still increasing.* It may be shown that wages have increased about as rapidly, though not so evenly. In estimating wages, allowance must of course be made for price changes. This may be done by dividing an average of common wages for any given year by the average of prices for the same year. Data are furnished by the Bureau of Labor Statistics from which such an estimate may be made. The results are called "real wages" to distinguish them from the wages as paid in current prices. For comparison it is found more convenient to express real wages in percentages of the year from which prices are reckoned. The base year now commonly chosen is 1913. Thus expressed, the index of real wages in the United States appears as follows:

TABLE III. REAL WAGES IN THE UNITED STATES

YEAR	INDEX OF REAL WAGES
1870	48
1875	54
1880	56
1885	76
1890	85
1895	97
1900	91
1905	96
1910	94
1915	102

These figures show that real wages rose very rapidly up to 1895, but that since then they have not advanced much. Some such results might

* American industry probably leads the world in per capita production. Even before the war British incomes averages only about seventy per cent of American, and a certain part of that was from foreign investments.

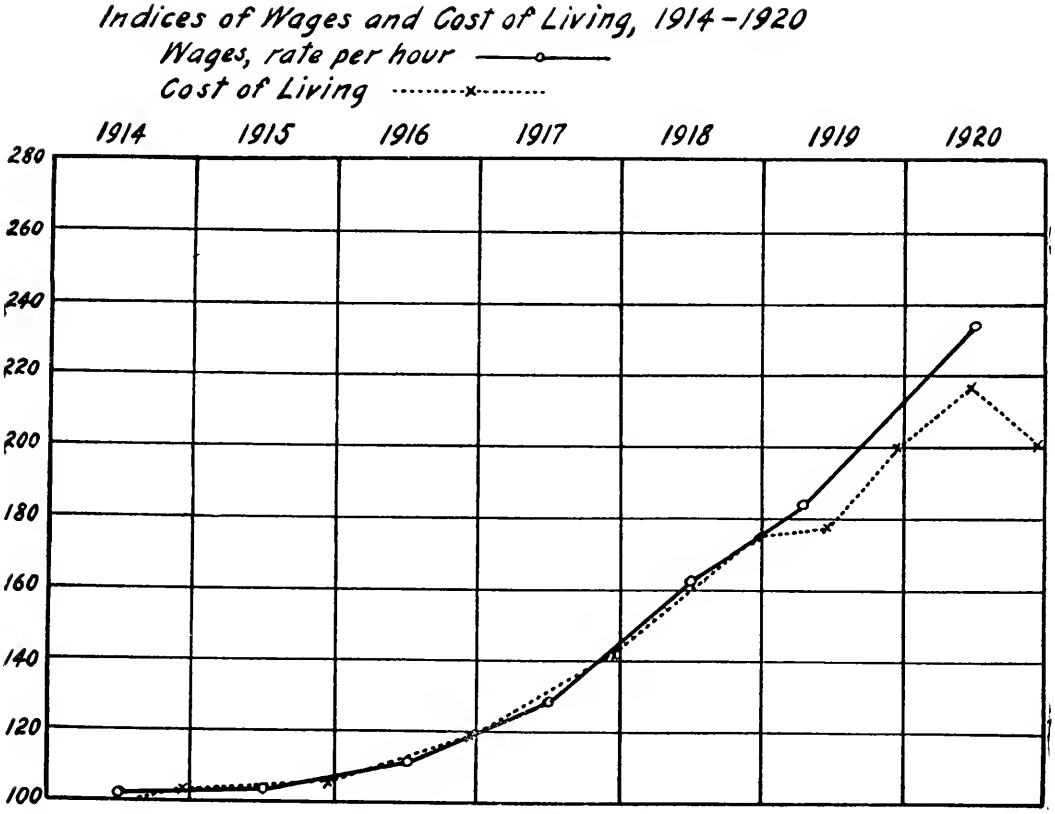
be expected, since by the end of the nineteenth century population had about caught up with the rapid industrial advance. The volume of capital used was greatly increasing, and land values were advancing as a result of the relative closing of the frontiers. But the slackening of advance in common wages is compensated for by the widening opportunities in the skilled occupations and the professions.

The movement of wages and prices during and since the war is of interest, and is valuable as throwing light on the responsiveness of the labor market. It is often said that wages are stabilized by custom, and that therefore they move much more slowly than prices. This may have been very true in former days. It may also be true today of certain occupations, such as the postal service, teaching and preaching. But it is not so true of industrial wages, under present conditions. A considerable portion of the labor army is mobile, and quickly moves to the point of greatest demand. Union activities also tend to push wages up whenever the condition of the market makes it possible. Therefore the market for labor is coming to be almost as responsive as for commodities. At least, such is the conclusion that is suggested by a review of the figures for the last few years. The following table gives indexes for prices, and for labor of specified kinds.

TABLE IV. PRICES AND WAGES IN THE UNITED STATES SINCE 1913

YEAR	WHOLESALE PRICES	COST OF LIVING*	WAGES (hour rates)	HARVEST HANDS	UNION RATES (minimum)
1913	100	100	100	100	100
1914	100	100	102	98	102
1915	101	101	103	99	102
1916	124	108	111	107	106
1917	176	133	128	131	112
1918	196	155	162	166	130
1919	212	184	197*	197	148
1920	243	212	222*	225	189

* Annual indices estimated from seasonal data. Source, Bureau of Labor Statistics.



Monthly Labor Review, Feb., 1921
pp. 61 and 74

FIGURE 1

These data show that wages and the cost of living have moved approximately together. If real wages were to be computed, they would therefore show little change, except for a certain rise after the armistice. The movement of wages was not, however, nearly so uniform as averages make them appear. Some shot rapidly ahead and others lagged behind. Even in the same occupation, as farming, wide discrepancies appeared. But this scattering was not confined to wages only, for it appeared also in price changes. In connection with price changes, both wholesale indices and retail cost of living indices are shown. This is done for comparison, since there was a prevalent erroneous use of wholesale figures in checking up the movement of wages. It is true that over considerable periods of time wholesale and retail prices follow much the same trend, but in a period of sudden change the latter lag behind. Since the annual indices for cost of living and in part for wages are estimates, the Bureau of Labor Statistics data as originally published are presented in graphic form. (Figure 1.)

In the foregoing discussion we have considered labor as a commodity. This is not meant to imply that the human side of the labor problem is forgotten. But when we are speaking of what determines wages in a labor market, we are necessarily obliged to concentrate upon factors of supply and demand. That human beings embodying the labor power which is bought and sold have rights to considerate treatment, goes without saying. The common protest against classing labor merely as a commodity is justified. The same point should in fairness also be made regarding capital. Though capital is based upon material things, yet back of it are human rights of leadership, management, and dependency that must be taken into account when legislation is contemplated.

5. VALUE AND PRICES

Wages and the returns to capital (except perhaps a margin of excess and final profits) make up the cost of production. This cost appears normally in the prices of the goods sold on the market. It is therefore usually

said that cost of production is the proper basis on which prices are established. This is only partially true, for the rule works both ways. The price of wheat land, for example, depends on the fact that the public demands white bread. The price that the public will pay for such bread is therefore a big factor in determining the cost of production. This consideration will serve to introduce the difficult problem of value.

To think clearly regarding value we must first adopt the abstract idea of considering people in dual capacities. Practically all persons are both producers and consumers. But, for convenience, we are obliged to think of consumers as if they were a different class set over against producers. Since the majority of people produce directly for other persons rather than for themselves, this figure of speech is allowable.

Consumers have certain more or less definite requirements determined by various combinations of such forces as: nature, instinct, custom, income, suggestion, fashion, and whim. They look upon certain goods, therefore, as having utility. Sometimes this utility is real, as in the case of food; sometimes it is imagined, as in the case of curios; but whether real or imagined it is a force in determining prevailing values. If the desired goods can be had with little or no trouble, value may be next to nothing, though the utility is high. Such is the case with water and air. But if the desirable goods take labor and material to produce them, their value rises. If, again, they depend on land that is scarce, as precious metals, demand will drive up the value of the land, and the goods will be correspondingly valuable.

Between the price that people are willing to pay, and the difficulty of obtaining the goods, an equilibrium tends to be established. If people decide to use more of a certain thing, and are willing to pay the price, production spreads over to less advantageous lands and means, and the cost of production rises. If they decide to use less, capital and labor retreat to the more advantageous sources, and cost of production falls. At the price thus set, each consumer uses such quantities as may be appropriate

in view of the diminishing utility to him. Diminishing utility is, of course, merely a personal phase of the law of diminishing returns. To a person of moderate means, a hundred dollars expended in a given season for hats will not bring ten times the satisfaction that a ten-dollar expenditure would bring. The thoughtful consumer naturally tries to apportion his income over the various categories of food, clothing, housing, recreation, and miscellanies in such a way as to get the best balanced returns for his money.

We must now recall the fact that producers and consumers are really the same set of persons. What they make as producers, they spend as consumers and investors. Therefore in the aggregate, supply and demand are necessarily equal.

There are, of course, certain ideal values (or social values) that would develop in the market if all persons were perfectly wise and virtuous. Such a market would measure the real exchange values of goods. But frail humanity doubtless often appraises dross as gold, while real quality goes without a bidder. Hence real values and current values are by no means identical. But the economist must study things as he finds them, so when utilities and values are mentioned, the current estimate is assumed to be valid.

Value is measured in terms of price. Price is the actual exchange ratio between goods and money. If coal sells at ten dollars a ton, this means that a unit of coal is approximately equal in value to ten units of money. As we have seen, the value of the coal depends upon its utility, the scarcity of good coal lands, and the capital and labor needed to mine and transport it. Some people would charge a part of the price to profiteering. Be that as it may, the coal in the market is equated with the price that it brings.

Next, what determines the value of money? We find that in business payments may be made with credit (bank checks and paper money), with light-weight minor coins, or with gold. In any case the last is the basis on

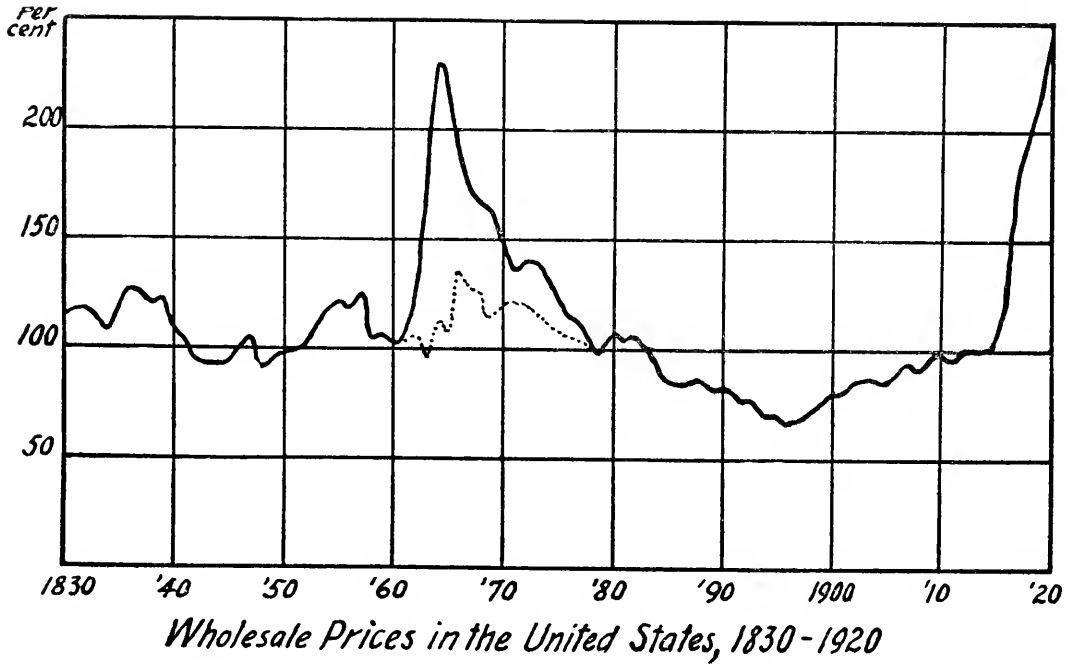

Per cent
200
150
100
50
1830
'40
'50
'60
'70
'80
'90
1900
'10
'20
Wholesale Prices in the United States, 1830-1920

FIGURE 2

which the payments, through possible exchange, rest. A dollar in reality is 23.22 grains of pure gold. And evidently the value of the gold is determined in practically the same way as coal. The only essential difference is that the gold miner must sell in a constant market, since the price of his product is fixed at the mint.

Since money rests on gold, as is the case under the gold standard, we might expect that when a Klondike is opened, or when improved methods of extracting the metal are put into use, money would tend to become cheaper. This is not meant to refer to the interest rate, which has already been treated, but to the exchange value of gold. Since the gold would be obtained more easily, its value should under such conditions be less. Conversely, when mines play out, or when the growth of business has greatly stressed the demand for gold, we might expect the value of money to rise. This is, in fact, the case. But, it will be asked, how can a dollar vary in value when its price is fixed by law at the mint? Is not a dolar always worth just a dollar? The answer is that the value of money is measured by what it will buy. When prices double, as they have in the last few years, the dollar is worth half as much, because it will buy only half as much.

The fundamental explanation, then, of the price level lies in the relation between goods in general and the standard money. If both increase or decrease together, prices tend to remain steady. But if one becomes relatively more abundant, its value falls, and the value of the other rises. So, great increases in gold have brought rising prices; while periods of steady improvement in the production from factory and farm, have brought falling prices. The rising prices from 1896 to 1914 are an example of the former condition, and the falling prices from 1878 to 1896 are an example of the latter. (Figure 2.)

In order fully to explain the changes in general prices, we must turn to other factors that modify the price level. The most important is the use of credit as a form of, or a substitute for, money. Credit may be utilized

in the form of paper money issued by the government. Such money may be given an initial value by being made redeemable in gold, or simply by being receivable for taxes and by being declared legal tender. When such money is put into circulation in large quantities, the value of the circulating medium falls, and goods rise. Even though the public may have full confidence in their government, the value of the money will decline simply from the fact of its abundance. Or, to put it another way, abundant money bids up the prices of goods.

But prices thus inflated will cause the standard coins to disappear. This will occur at first through international trade. High prices attract goods from abroad, and gold goes out in settlement of the adverse balance of trade. But even apart from such exchange, gold will disappear because of an increased use as jewelry and other articles. For such articles tend to rise with other prices. Then an increased profit accrues to the goldsmith, since as long as the gold standard is in force he can get his raw material at a fixed cost merely by melting standard coins. Hence he puts an abundant supply on the market, and pushes his sales or lowers his prices, as he can well afford to do. On the other hand, the gold miner finds his business unprofitable, since he must pay more for labor and materials, and yet sell at a fixed price. Gold production therefore falls off. Thus the paper money gradually displaces the gold.

But if the issue of paper money is not excessive, the rise in price is largely relieved as the gold disappears from circulation. Things may then settle down on the basis of a currency consisting principally of paper. As long as a safe margin of gold remains, the use of credit money is commendable as an economy.

If business is conducted for some time on the basis of a currency consisting largely of paper, and this currency is suddenly contracted, results exactly the reverse of those just described will appear. Money, being scarce, rises in value. Prices consequently fall. Low prices attract foreign

buyers, and gold comes into the country. The production of jewelry falls off, since its price declines, while the principal element in its cost remains fixed. Gold producers thrive on low costs, and their output increases. Consequently the gold available for circulation gradually increases.

From the foregoing description of the inflation and deflation of a gold currency by the use of paper, the adjustment between the value of gold and the price level may be understood. But as a rule the buffer between the standard money and goods is not political money, but bank credit. When commercial banks have a surplus of gold or other legal reserves, they lower their interest rate and make loans on properly secured business paper. The loans are entered on the books, and are transferred by check. They are therefore often called "deposit currency." In such transactions the banks are in effect putting into circulation the private notes of business men, backed by their own credit. In a more formal way the Federal Reserve banks make business paper the basis of their own circulating notes, adding for security an adequate gold reserve. It is evident that "deposit currency" will have the same effect on prices as Federal Reserve notes or greenbacks. When the quantity increases, money cheapens and prices rise. As prices rise, more money is needed in circulation outside of the banks, and the demand for loans becomes greater. Eventually gold begins to be drained away just as in the case of the issuance of paper money already described. Then the bankers raise the interest rate, and advocate the liquidation of loans and the contraction of business to safe limits.* As bank credit is contracted through liquidation, prices fall. Thus an equilibrium between the value of gold and the average value of goods tends, with many fluctuations, to be maintained.

A final factor to be noted is largely psychological. This is the rate of circulation. If business becomes very brisk, money and credit are circulated rapidly. This has much the same effect as increasing the quantity,

* Temporary relief is often obtained by the use of capital from abroad, which is attracted by high interest. But this merely diffuses the strain of inflation, and does not cure it.

since each unit transacts more business. Hence when people are optimistic and lavish in their expenditures, prices are driven up somewhat, simply as a result of this factor. But when reserves are running low, and when high interest on bank loans is threatening profits, a spirit of pessimism checks the rate of spending. Perhaps the public then suddenly becomes economical, as was the case in the crisis of 1920. This is spoken of as a consumers' strike. Such a reaction naturally follows a period of over-activity and extravagance.

The chief factors directly determining the price level are often expressed in the following formula: $P = MR \div N$. This means that prices (P) vary directly as the circulating medium (M) and the rate of currency circulation (R), and inversely as the number of physical units of goods (N) transferred in the aggregate of trade. MR really means the total sales during the period in question, in dollars at actual prices. N is equivalent to the value of the same goods at average prices, or at the prices of some year chosen as a base. The one divided by the other will evidently give the percentage of the current prices to those taken as the standard. The formula is useful as a basis for understanding price movements, but of course it does not explain why at certain times production or circulation increase, or why the rate is unsteady. In applying the formula, indices are used rather than absolute numbers. It is difficult to get any statistical measure of the number of goods traded, but this naturally varies more or less closely with production. Hence an index of physical production is substituted for N. Consequently the increases in the circulation of money and in the exchanges of goods that are due merely to speculation cancel out, and R stands for changes in the activity of buying for use.

The following table gives indices based on estimates of the values entering into the equation of exchange for the past eight years. In arriving at the value of M, bank deposits subject to check are given double the importance of actual money, since they circulate at about twice the rate of the latter. For much of the data used, indebtedness is acknowledged to

Professor Kemmerer's "High Prices and Deflation." The value of R is computed from the other factors. It should conform to the known changes in business activity, as apparently it does.

TABLE V. THE EQUATION OF EXCHANGE, 1913–1920

INDICES OF:

YEAR	WHOLESALE PRICES P	=	CIRCULATING MEDIUM M	×	RATE OF CIRCULATION R	÷	PHYSICAL PRODUCTION N
1913	100		100		100		100
1914	100		105		94		99
1915	101		112		96		106
1916	124		137		101		112
1917	176		167		121		115
1918	196		186		120		114
1919	212		215		104		105
1920	243		230		117		111

One further fact may be noted regarding the relation of money and credit to prices. If credit in the form of paper money or bank loans is greatly increased, we have seen that the gold reserves tend to disappear, and deflation is made necessary. But suppose a country should hoard the gold reserves in the central banks and refuse to pay out coin for paper, while at the same time continually increasing the issues of paper. Such an action would send the paper money to a discount, that is, gold would be at a premium. The connection between the paper and the gold currency would be broken and prices in terms of the paper would soar, though in terms of gold they might not change greatly. This is what usually happens in times of war. At such times, also, prices may be still further heightened by a scarcity of goods. Most of the currencies of Europe are at present virtually on a paper basis, in spite of the hoarded gold which is held as reserves against the credit currency. The same thing happened in the United States

during the Civil War, but not during the recent war. However, the great gold importations of 1915 and 1916, together with the expansion of bank credit made possible by the newly established Federal Reserve system, had the effect of sending prices up about as high as the former greenback prices. But the gold standard was nominally preserved, except for a temporary restriction for a couple of years in the way of a gold embargo.

We may now observe briefly the application of the foregoing principles to the activity of the general market and the course of prices.

6. BUSINESS CYCLES

Business moves in irregular cycles. This may be illustrated by the figures just given (Table V) showing the course of business since 1913. The depression of 1921 may be compared with its parallel in 1914. The war stimulated business, and an early crest of the wave appeared in 1917 and 1918. The armistice brought a brief downward movement, which is reflected in the production and rate of monetary circulation of 1919. But the latter part of that year saw easy money and a continuance of prosperity. The climax was reached about May, 1920. High interest and a consumers' strike precipitated a rapid downward movement, as drastic as anything that may be found in our history. Only the resources of the Federal Reserve system prevented a disastrous panic. The painful process of readjustment of all phases of business followed. Capital values, prices, and wages are being re-established on a level nearer to what is warranted by the supply of sound money.

Looked at in the large, business cycles are found to be influenced by cycles in climatic conditions, which affect the crops. But this connection is too remote to be of much practical value in judging the market. It may be said, though, that good crops act as a gradual promoter of business prosperity, though the effects may be delayed. The business cycle is far more directly related to the inflation and deflation process already described than to anything else.

What, then, are the signs by which the changing phases of the business cycle may be known? A number of reliable barometers, so-called, are in general use. The central phase of the cycle, the actual productive activity of business, may be measured by large bank clearings, output of iron, building permits, railroad gross earnings, imports, or other data. Of course price movements are also excellent indicators. These may be measured by several popular indexes, such as Bradstreet's and Dun's. The Bureau of Labor Statistics index is probably better than either of these, but it does not appear so promptly. In a general way, all these factors rise and fall together like a great tidal wave, though exceptional conditions may cause them to vary. In most cases something must be allowed for seasonal variations. Thus railroad gross earnings regularly rise at harvest time and fall in the winter. But allowing for this, the longer movements of the cycle may still be seen.

Predictions of coming changes in the cycle may best be read from data on speculation and banking. The percentage of reserves held by the Federal Reserve banks is perhaps today the central indicator. Though the policy of the Board may temporarily modify the situation, yet if reserves are steadily rising, sooner or later the interest rate will fall. This will stimulate business, but the first effects will commonly be observed in speculative activities. Thus the trend of business on the New York Stock Exchange is one of the best business forecasters. A steady rise in stocks after a period of depression will herald business activities some six months or so in advance. Similarly, a general decline in the stocks will herald a depression.

As the business cycle waxes toward its climax, the interest rate will be observed to rise, for reasons already explained. This measures the strain that is being thrown upon the banks. As the strain grows, the break in business and prices approaches. By watching the various barometers as they are reported in the financial journals, one may catch the early signs of the change. The details of personal business may then be adjusted accordingly.

7. CONCLUSION

In conclusion a word may be said regarding the modern tendency toward large scale consolidation. Such organization brings marked advantages, which must be tried out and limited by the law of diminishing returns. But at the same time they bring a danger of monopoly. It is likely that consolidations and organizations of various sorts will increase rather than decrease. Doubtless ways will be found of securing the advantages of such co-operation, while at the same time eliminating the monopolistic elements. In any case, whatever direction business evolution may take, we may be sure that we shall have need of an ever widening knowledge of economic law.

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